TECHNOLOGY

Ultra-Porous Silica Opal-Like Particles and Polymer/Silica Composites

OVERVIEW

Opals are iridescent gems found in nature in which silica nano-spheres are packed together in regular microstructures. Their inverse replicas (i.e., regular arrangements of void spaces surrounded by solid silica walls), called “inverse opals,” are currently the object of active research due to their applications in photonic crystals, catalysis, fuel cell membranes, bioactive materials, and more.

Researchers at the University of Maryland have developed a novel synthetic technique to prepare silica inverse opal-like microspheres of ultrahigh specific surface area and very small bulk density and polymer/silica nanocomposites. These novel materials are expected to have new potential applications in catalysis, thermal insulation, fuel cell membranes, sensors, electrochemisrtty, drug delivery, chemical filtration, and gas absorption, among others. The synthetic technique can also be applied to the preparation of titania and zirconia particles of similar morphological characteristics.

Applications:

• Catalyst support
• Additives to cosmetics
• Thermal insulation
• Fuel cell membranes
• Sensors
• Electrochemistry
• Drug delivery
• Chemical filtration
• Gas absorption

Advantages:

• Unlike other inverse opals structures, these particles consist of a 3-dimensional-spherical arrangement.
• Unlike other silica structures, these particles are characterized by a huge specific surface area and a widely-open and interconnected porous structure.
• Cheaper to produce than other inverse opals.

CONTACT INFO

UM Ventures
0134 Lee Building
7809 Regents Drive
College Park, MD 20742
Email: umdtechtransfer@umd.edu
Phone: (301) 405-3947 | Fax: (301) 314-9502

Additional Information

INSTITUTION

University of Maryland, College Park

PATENT STATUS

Patent(s) pending

LICENSE STATUS

Available for exclusive or non-exclusive license

EXTERNAL RESOURCES

- US Patent 8,940,655

PS-2010-102