

Superhydrophobic Nanomaterials for Oil Spill Cleanup

Technology #12387

Applications

Applications include removal of contaminated oil or organic spills on water (hydrophobic properties) as well as removing water droplets from oils (hydrophilic properties).

Problem Addressed

Large-scale, free-standing structures of advanced nanomaterials for practical applications are currently very difficult to achieve.

Technology

The invention includes a simple and rapid approach to controlling surface wetting, based on self-assembled free-standing structures of ultralong manganese oxide nanowires. The nanowire assemblies, composed of micro- and nanoporous structures that span multiple length scales, exhibit a remarkably superhydrophilic response. When coated with a thin layer of hydrophobic molecules, the nanowire assemblies become superhydrophobic. The assemblies of this invention are useful in various applications, including removal of organics or hydrophobic materials, and waterproofing applications.

Advantages

- Cost-effective fabrication
- High surface area
- Thermal stability
- Self-supporting structures
- High uptake capacity

Categories For This Invention:

Materials

Hydrophobic/Hydrophilic

Life Sciences

Environment

Remediation

Water Purification

Intellectual Property:

Absorbant superhydrophobic materials, and methods of preparation and use thereof
Issued US Patent

8,591,952

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Publications:

Superwetting Nanowire Membranes for Selective Absorption
Nature Nanotechnology
3, 332 - 336 (2008)

External Links:

Nanomaterials and Electronics Group
<http://www.rle.mit.edu/nmeg/publications/>

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