TECHNOLOGY
Tunable Nanoparticle Array

OVERVIEW

Background
Surface-enhanced Raman scattering (SERS) is a spectroscopic and analytic technique that achieves extreme sensitivity through the strong coupling between electromagnetic radiation, plasmon modes of a surface, and electronic states of molecule, which in turn couple to the vibrational modes of the molecule. SERS substrates are often fabricated using lithographic techniques such as e-beam lithography, imprint lithography, and nanosphere lithography. However, each of these methods involves a compromise between enhancement factor, cost, active area, reproducibility, and service life.

Innovative Technology
Researchers at the University of Maryland have developed a novel method for fabrication of SERS substrates that show a unique combination of three highly desirable attributes: These SERS substrates have optical, magnetic, and electronic properties that are tunable; they also have a highly reproducible enhancement factor over macroscopic sampling areas. Finally, the substrates can be made entirely through self-assembly and templating techniques, which are cost-effective, scalable to large areas, and appealing for mass production.

Applications:

1. Substrates for SERS
2. Magnetic recording media
2. Nano-fabrication rulers
4. Optical filters
5. Environmental sensors

Advantages:

1. Tunable optical, magnetic, and electronic properties
2. Reproducible enhancement factor over macroscopic sampling areas
3. Cost-effective, scalable, and easy to produce

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

CATEGORIES

- Nanotechnology + Nanoparticles + Nanomaterials

EXTERNAL RESOURCES

- US Patent 9,279,759

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