

Nanopattern generation using modified nanosphere lithography

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PROJECT DESCRIPTION:

Electron beam lithography and focused ion beam milling are widely used in nanofabrication due to their high resolution. Unfortunately, the low efficiency and the high cost have limited their applications in fabrication of nanostructures on the scale of usual optical coatings at reasonable costs and time. A series of simple, low-cost and effective methods have been developed based on modified nanosphere lithography to fabricate large-area nanostructure arrays.

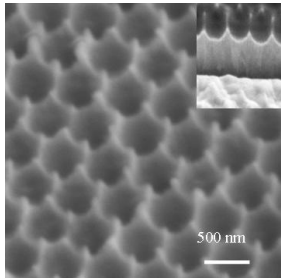


Figure 1. Nickel nanobowls with pillars on the top.

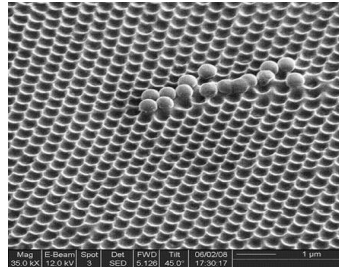


Figure 2. PDMS nanobowls with some nanospheres on top.

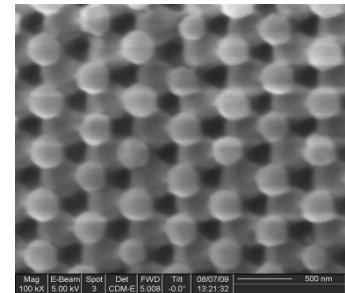


Figure 3. A bilayer self-assembly of PS spheres after oxygen treatment.

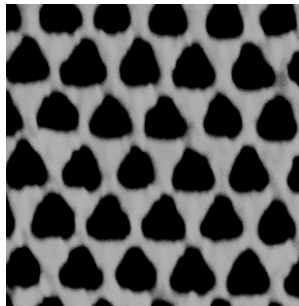


Figure 4. Size-tunable silicon nanopores.

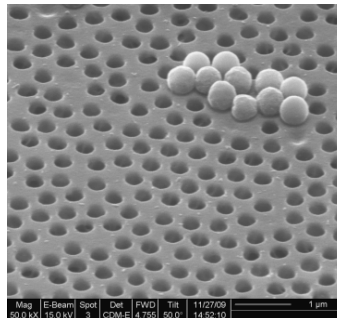


Figure 5. Photoresist nanoholes.

SELECTED PUBLICATIONS IN THE AREA

- [1] X. Chen, X. Wei, K. Jiang, "Fabrication of high-aspect-ratio, size-tunable nanopore arrays by modified nanosphere lithography", *Nanotechnology*, 2009, 20, 425605 (5pp).
- [2] X. Chen, X. Wei, K. Jiang, "Fabrication of large-area nickel nanobump arrays", *Microelectron. Eng.*, 2009, 871-873.
- [3] X. Chen, X. Wei, K. Jiang, "Large-scale fabrication of ordered metallic hybrid nanostructures", *Optics Express*, 2008, 16, 11888-11893.