

Nano Patterning System using SAM

Biomimetic Nanotemplate

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Biomimetic ultra water repellent (UWR) layer manufacturing technique

Patent submitting



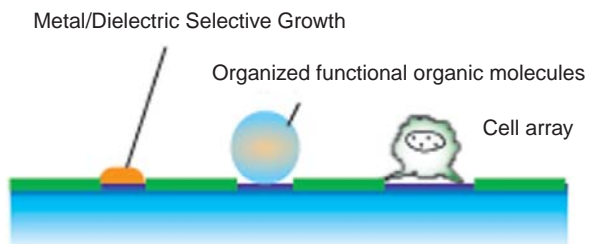
Waterdrop on the glass (surface is processed of UWR layer)

- Learning from nanostructure of Lotus leaf how to make UWR layer
- Room temperature process, so polymer substrates can be treated
- Transparent and ultrahard layer

Extreme water repellency

Micromachining Nanoassembling Technique

Patent submitting



- Micromachining technique from micro to single nano domain
- Nanoassembling
- Multifunctional substrate

Low cost nano/micro structure realization

Autonomic Nano Manufacturing Device



Tissue engineering biochip by using cell-solid mold

Patent submitting



Biofluid

Example 1

Example 2

Cell culture pattern

Mouse fibroblast

Hydrophobic domain

Hydrophilic domain

Spherical cell culture in UWR regions

Example 3

cell-solid mold

Hydrophobic film

After lithography Hydrophilic

Example 4

Sub-50 μm pattern

World first cell-solid mold method using cell embryology culture for man-made blood vessel, next generation regenerative medicine - original research

Industrial applications

- Application**
- Nanotemplate with hydrophobic-hydrophilic functional regions
 - World first cell-solid mold method (Example4) ~Regenerative medicine~

- Task**
- Low-cost method
 - ES cell cultivation • organization using surface functionalization

Aichi/Nagoya knowledge Clusters announces venture business with Nagoya University

Vacuum UV lithography device

Organic thin films manufacturing device

R&D of SAM nano-patterning system

n-Factory

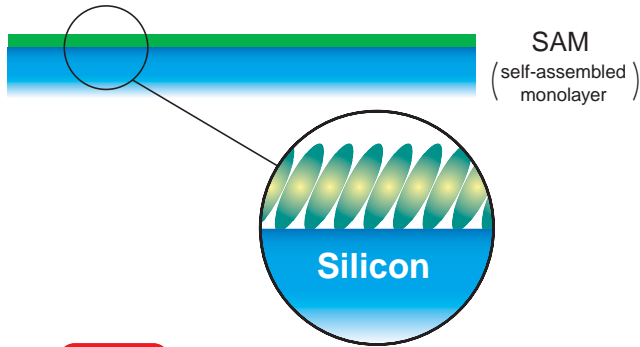
Contact: Nagahiro SAITO (nagahiro@plasma.numse.nagoya-u.ac.jp)

Vacuum UV device for surface cleaning

Various plasma devices for thin films deposition

Autonomic SAM Patterning and Bottom-up Technology

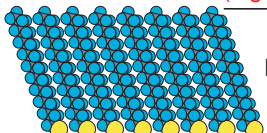
Next generation photo resist film for sub-100 nm resolution



Feature

Nano resist instead of usual polymeric resists

Molecules arrange due to inter-molecular forces (**high self-organizing strength**)

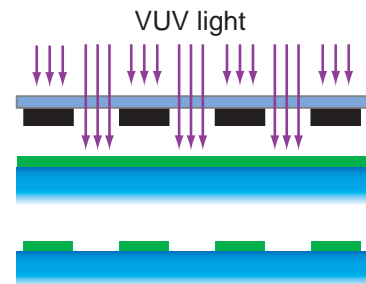


Film thickness : Single Molecule
1~2nm

Attachment to substrate through chemisorption (**high chemical strength**)

Molecules gather and assemble spontaneously forming an organic thin film

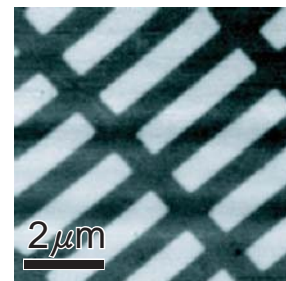
Vacuum UV (VUV) lithography technology



Sub- μm patterning

Feature

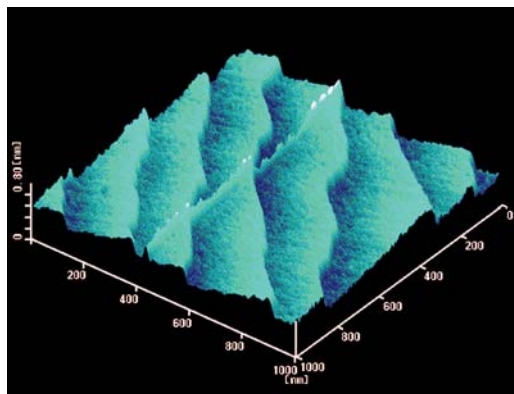
Lithography using a simple optics device



SAM patterning

Scanning-probe nano lithography

SiO₂ nano-line fabricated on atomic stepped Si



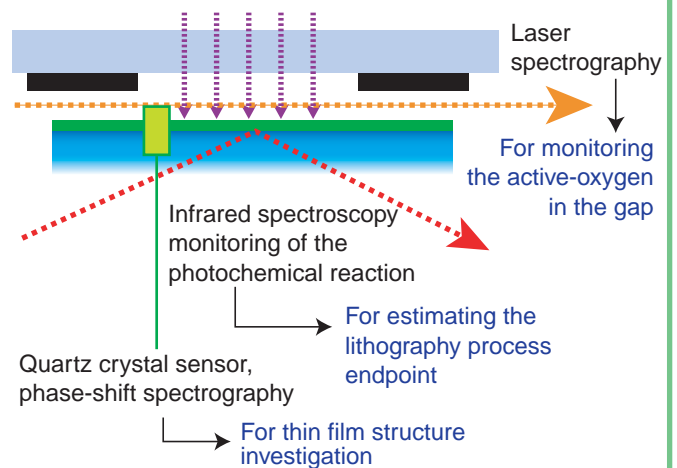
Feature

Program for next-next-generation advanced lithography systems

Highly sensitive methods for organic ultra thin films investigation

Patent submitting

Process control for autonomic device



Feature

Advanced control system for the autonomic nano-fabrication device