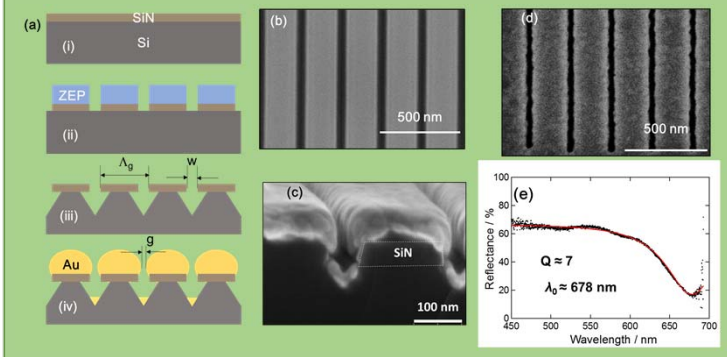
超微細加工を利用したプラズモニックデバイスの製作
Nano Fabrication for Plasmonic Devices

概 要

プラズモンを起こすようなデバイスを超微細加工を利用したプロセスで作った結果を報告する。今回、製作したパターンは金ナノワイヤと金ナノ粒子配列であり、基板はSi基板とクォーツ基板を用いた。

This poster shows the results about making plasmon devices by nanofabrication. The pattern are gold nanowires and nanoparticles on a Si or quartz substrate.

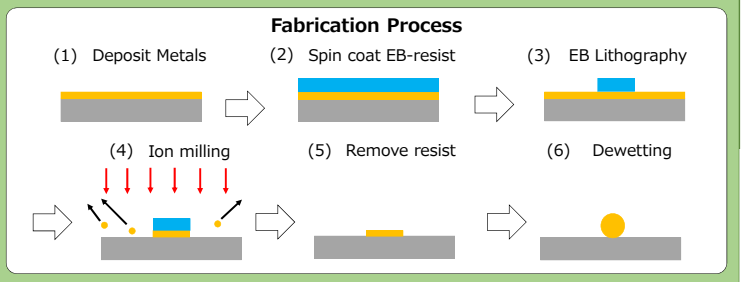
Making Plasmonic Devices with Gold Nanowires

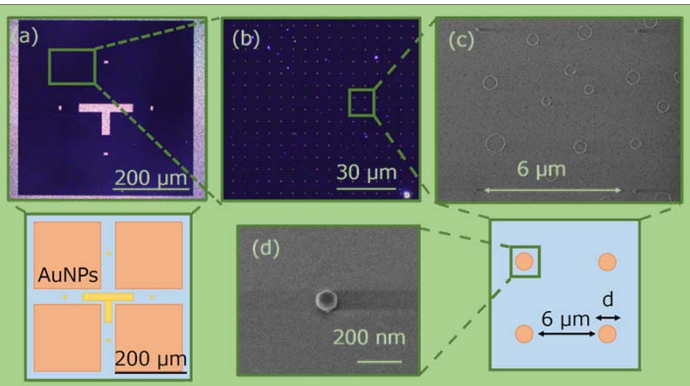


(a) Making process
(ii) EB patterning and RIE process
(iii) KOH etching
(iv) Gold sputtering
(b) Top view SEM image of (a)(iii)
(c) Cross section SEM image after sputtering
(d) Top view SEM image after sputtering
(e) Reflectance spectrum of (d)

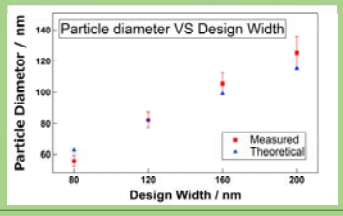
Micro Dot Patterning.
This drawing is made by using 2 μm × 2 μm square patterned area

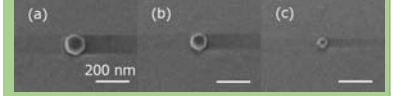
Gold Nanoparticle Array on Quartz Substrate





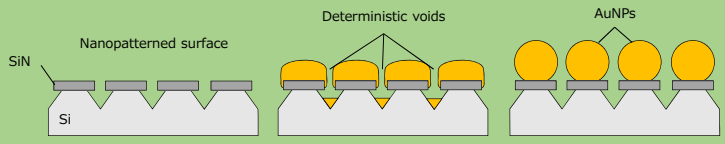
Gold NanoParticles on Quartz substrate
(a),(b) DF Microscopy image (c) SEM image (d) SEM image (30° tilted)



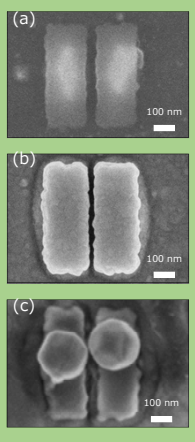


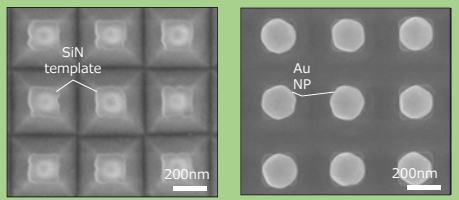
Standard deviation of nanoparticle diameter is under 10%

Gold Nanoparticle Array using Template Guided Dewetting



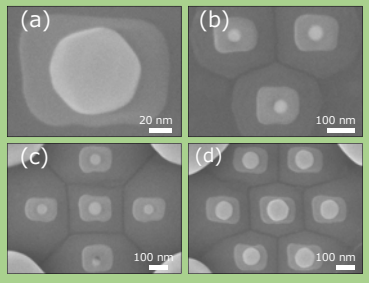
Nanopatterned surface results in and isolated gold film. And thermal dewetting results in a gold nanoparticle array.





Gold nanoparticle array fabricated this process.

(a) Nanopatterned surface
(b) Gold film formed by sputtering
(c) Gold nanoparticles



Nanoscale geometry arrangement.
(a) Monomer (b) Trimer (c) Pentamer
(d) Heptamer

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