課題番号　　:F-15-UT-0141
利用形態　　:機器利用
利用課題名(日本語)　　:
Program Title (English)　:3D nanostructures fabricated by advanced stencil lithography
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1. 概要(Summary)

This study reports on a novel fabrication method of 3D metal nanostructures using high-throughput nanostencil lithography.

Aperture clogging, which occurs on the stencil membranes during physical vapor deposition, is leveraged to create complex topographies in nanoscale. Precision of the 3D nanofabrication method is studied in terms of geometric parameters and material types. The versatility of the technique is demonstrated on various symmetric and chiral patterns made of Al and Au.

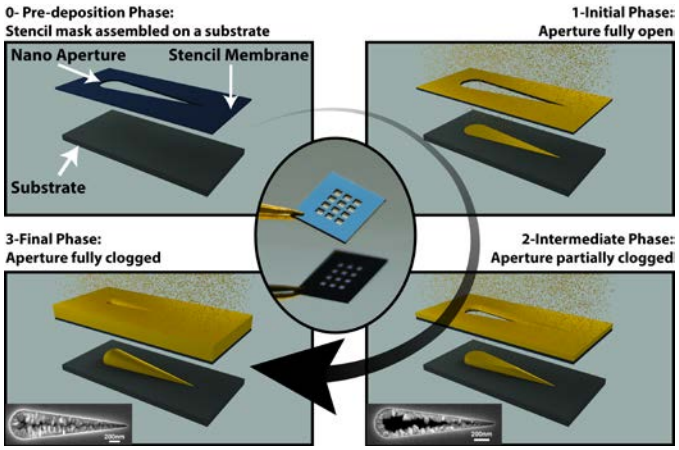

Fig. 1 Stencil mask lithography clogging effect.

2. 実験(Experimental)

【利用した主な装置】

ブレードダイサー(DAD340),

4 インチ高真空 EB 蒸着装置

【実験方法】

プラットフォーム支援機関で実施した内容: ナノステンシルマスク(シャドウマスク)を用いた、3次元構造のナノ金属(Auと Al)の構造物をシャドウマスクの clogging 現象を利用して簡単に創造できる技術を開発した。そのために、高真空 EB-蒸着装置を利用した。

3. 結果と考察(Results and Discussion)

This novel application of stencil lithography for the third dimension control in the nanoscale has great potential to pave the way for applications in many fields, such as photonics and bio-inspired materials.

4. その他・特記事項(Others)

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5. 論文・学会発表(Publication/Presentation)

(1) Filiz Yesilkoy, Valentin Flauraud, Matthieu Rüegg, Beomjoon Kim, and Jürgen Brugger: 3D nanostructures fabricated by advanced stencil lithography, **Nanoscale** RSC, 2016 (impact factor:7.394) (in press)

6. 関連特許(Patent)

なし。