

課題番号 : F-15-UT-0032
利用形態 : 技術補助
利用課題名(日本語) :
Program Title (English) : e-beam nanopattern fabrication for optical applications
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1. 概要(Summary)

The goal is to nanopattern large area surface (few cm²) using e-beam lithography and standard etching technique to obtain nanopillars or nanocavities in Si wafer. These nanostructures will then be investigated for optical applications.

2. 実験(Experimental)

【利用した主な装置】

- ・高速大面積電子線描画装置 ADVANTEST F7000S-VD01
- ・汎用 ICP エッチング装置 ULVAC CE-300I
- ・形状評価装置 Dektak XT-S
- ・電子顕微鏡 Hitachi S-4700

【実験方法】

Process used:

- Si wafer cleaning (acetone, ethanol, DI water + HF)
- Adhesion promoter and negative resin spin coating
- E-beam exposure
- Resin development
- Resin/Si etching to transfer pattern into Si wafer
- Si mold cleaning (O₂ etching + piranha solution)

3. 結果と考察(Results and Discussion)

Nanopillars with several heights and diameters have been obtained by playing with exposure dose as well as etching time.

Figure 1 shows SEM images of obtained

nanopillars structure.

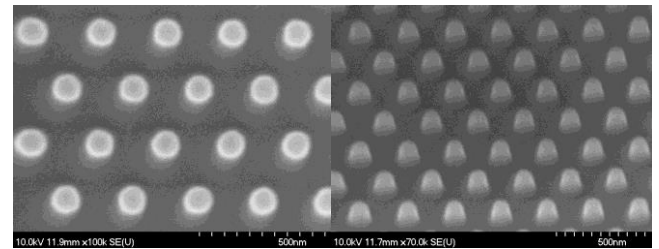


Figure 1. SEM observation of fabricated nanostructures (top view on the left image and 45 degrees tilted for the right image)

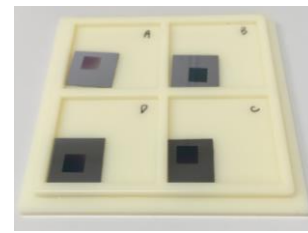


Figure 2. Various Si mold fabricated at VDEC through several process conditions

4. その他・特記事項(Others)

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5. 論文・学会発表(Publication/Presentation)

None

6. 関連特許(Patent)

None