課題番号　　:F-17-TU-0046
利用形態　　:機器利用
利用課題名（日本語）　　:Fe 基金属ガラスのナノインプリンティングによる磁性制御
Program Title(English)　　:The magnetic property of nanoimprinting Fe based metallic glass
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キーワード／Keyword　　:膜加工・エッチング、Cr mask, Photolithography, RIE etching, KOH etching

1. 概要（Summary）

The shape of a magnetic material strongly affects the magnetization process. Therefore, various kinds of patterns from micrometers to nano-meters were fabricated to tailor the magnetic anisotropy and domain dynamics. Nano-imprinting of Fe-based metallic glasses is very promising, and simultaneously the accurate Si die is vital to realize low cost magnetic nano-structures. Thus, the fabrication process of a variety of different specification Si molds was performed in Nishizawa center.

2. 実験（Experimental）

【利用した主な装置】　両面アライナ露光装置一式、レーザ描画装置、アネルバ RIE 装置

【実験方法】

1. Fabricating the Cr mask with a variety of different size patterns by laser writing.
2. Coating the photoresist on Si wafer and then performing photolithography with UV exposure.
3. Removing the SiO_2 layer by reactive ion etching and the perform KOH etching to fabricate the patterns.

3. 結果と考察（Results and Discussion）

A variety of different specification Si molds are finished successfully. But the terminal structure is different because of KOH etching. And the figure 1 and 2 show their structures after photolithography and KOH etching respectively.

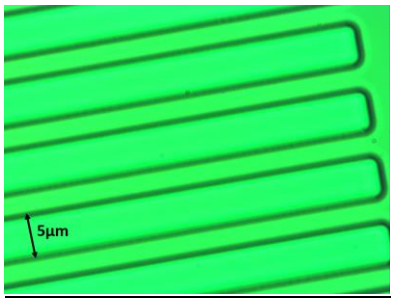

Fig. 1 Pictures of Si wafer after photolithography by optical microscope

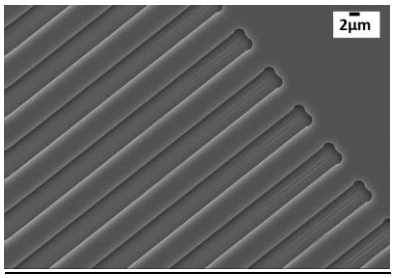

Fig. 2 Pictures of Si wafer after KOH etching by SEM

4. その他・特記事項（Others）

・共同研究者：New Industry Creation Hatchery Center(NICHe) P.Sharm

5. 論文・学会発表（Publication/Presentation）

(1) Liang Xiaoyu, Parmanand Sharma, Hidemi Kato, International Conference on Materials and Systems for Sustainability 2017, 2017.09.30

6. 関連特許（Patent）

なし。