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利用形態 :機器利用
利用課題名（日本語） :薄膜デバイスの微細加工プロセスの検討
Program Title (English) :Study of thin film devices fabrication
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1. 概要（Summary）

Training and usage of for B-5 両面アライナ SUSS MA6/BA6 Mask Aligner. Training and usage of for E-4 アネルバ RIE 装置 Anelva DEA-506 Reactive Ion Etching. Training and usage of for E-16 アルバック ICP-RIE#1 ULVAC NE550 and usage of for B-14 レーザ描画装置 HIMT DWL2000 Laser drawing

2. 実験（Experimental）

【利用した主な装置】

レーザ描画装置，両面アライナ露光装置一式，
アルバック ICP-RIE，アネルバ RIE 装置

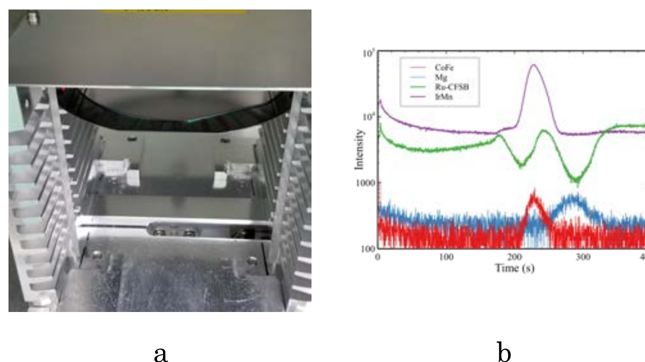
【実験方法】

New design mask set was fabricated using laser drawing machine then development and cleaning was performed as the procedure from last year. Usage of mask aligner and respective resist coating procedures were learned. New fabricated mask set was used at mask aligner for patterning frequently. ICP-RIE system was learned and used with installing optical emission spectroscopy system to monitor etching (Fig. 1b). Since sample size of system was 6-inch wafer, smaller samples were mounted on support wafer with aid of photoresist (Fig. 1a). Before the operation, poor heat transfer (cooling) between sample and heat sink was considered, it could burn the photoresist which faced argon plasma. Therefore, 5min Ar plasma process with sample, exchange with dummy wafer, cleaning of etching chamber with oxygen plasma, return to Ar plasma etching with sample scheme was cyclically applied. This scheme prevented burning of resist and it was chemically removed without problem.

Anelva DEA-506 RIE system was learned and used for SiO_2 etching. Etching rates for TEOS SiO_2 and Ru was measured and due to high selectivity of Ru, it was used as over etch stopper.

3. 結果と考察（Results and Discussion）

The peaks of various materials of the Magnetic Tunnel Junction multilayer film were detected by using optical emission spectroscopy (Fig. 1b). It was shown that microfabrication using this ICP-RIE is possible for sensor fabrication.



a b

Fig. 1: (a) Sample with 6” support wafer (b) Optical Emission Spectra

4. その他・特記事項（Others）

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5. 論文・学会発表（Publication/Presentation）

なし

6. 関連特許（Patent）

なし