

課題番号 : F-17-RO-0037
 利用形態 : 技術補助
 利用課題名(日本語) :
 Program Title (English) : Formation of SiN membrane on Si wafer by LPCVD
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1. 概要(Summary)

We aim to develop environmental cells for transmission electron microscope. These cells' windows should be made with thin SiN membrane. We would like to be trained how to make good thin SiN membrane on Si by low pressure chemical deposition (LPCVD), followed by etching process in NIMS foundry. We would like to coat a 20-50 nm thick SiN membrane on 2-inch silicon wafers using LPCVD facility in Hiroshima University. The LPCVD-SiN film is expected to have less stress than those of other methods and fits our need.

2. 実験(Experimental)

【Instruments】

Low-pressure CVD reactor for SiN deposition (F-RO-335) was utilized in Hiroshima University.

【Experimental Procedure】

Staffs of Hiroshima University provided ten single-side polished 2-inch Si wafers. The deposition was carried out at about 750°C and a low pressure of about 50 Pa. The precursor gases are NH₃ and SiH₄. The whole process took about 2.5 hours.

3. 結果と考察(Results and Discussion)

SiN membranes were deposited on 2-inch silicon wafers using LPCVD. The thickness of the SiN membranes ranges from 20 to 44 nm as shown in Table 1 and Fig. 1.

The five of them have been diced into chips as

shown in Fig. 2.

We are planning to make SiN windows by etching process in NIMS foundry in the near future.

Table 1. Thickness of SiN membranes on the ten Si wafers

Wafer No.	1	2	3	4	5	6	7	8	9	10
SiN (nm)	20	21	23	24	25	32	36	39	42	44



Fig. 1 Si wafers with SiN in sample container.



Fig. 2 The chips diced from the Si wafers.

4. その他・特記事項(Others)

None

5. 論文・学会発表(Publication/Presentation)

None

6. 関連特許(Patent)

None