

INTERNSHIP REPORT

Introduction

- Goal : create the smallest holes on SiN membranes.
- What is used : FIB + SEM
- That we have done : influence of

1 Coating

Different coating have been used : Cr and Au.

Moreover, the thickness of the coating may influence the quality of imaging and milling. We used different thickness :

- 10 nm Cr on a 100nm -thin membrane
- 5 nm Cr on a 30nm -thin membrane
- 2 nm Au on a 10nm -thin membrane

Au better for imaging ?

2 Milling holes

In order to mill some holes, the IonLine device for Focused Ion Beam (FIB) has been used. For all experiments, we used a Ga-ion FIB. Moreover, different column parameters such as the current and the aperture can be cleverly chosen.

The influence of the number of loops and the total amount of charges on the milling of holes has been observed.

Theses kind of holes have been obtained :

Ajouter images / valeur de diametres / total current / loops

3 Closing holes

Smaller holes can be achieved thanks to Scanning Electrons Microscopy (SEM). Once again, many parameters can be chosen :

- the cycle time (we chose the 4th mode : ...)
- the size of the scanning area
- the magnification
- the number of scans or the total duration of the scanning
- to make pauses or not

3.1 Repeatability

We did some repeatability experiments.

4 Measuring the hole size