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PECVD SiN 20 nm

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Summary:
This document describes how to deposit a silicon nitride film of 20 nm thickness on silicon wafer.

Table of content

1 Associated Documents & References

MSDS if chemicals or gas involved.
pecvd standard operating procedure
Rules and procedures of cleanroom

2 Equipment Used

Oxford Instrument (www.oxinst.com) "Plasmalab System 100 " plasma enhanced chemical vapor deposition (peCVD) system in Room 7175.

This equipment has to be reserved through the online resource scheduler. If you need training by the technician, check availability with him before reserving the equipment. Users have to go through regular training before using this equipment alone.

3   Verifications Prior to Processing

pecvd processing chamber has been gas plasma cleaned by previous user. Check with technician if the chamber needs to be opened for a physical clean scrubbing.

4   Recipe description

Start and warm up Oxford PECVD according to PECVD Standard Operating Procedure.

Set PECVD chuck temperature at 300 C.

Run Clean recipe CF4/O2   on empty chamber.
Load sample into chamber.

Pumpdown 10 minutes.
Preheat with N_2 gas, 600 mTorr, 1000 sccm, 3 min
plasma clean with N_2 1500 mTorr , 1000 sccm, 100 watts, 30 sec.
Load sample into PECVD cahber.
 Deposit at 650 mTorr with silane 5% in nitrogen 400 sccm, NH_3 at 20 sccm, N_2 at 600 sccm,
 Start RF at 50 watt for 13 seconds,   LF 40 watt, for 7 sec
Run time 1 minute.

Pump out chamber for 1 minute.
Unload sample from chamber.
Wait for sample to cool before attempting to pick it up.

Resulting film is 20.2 $\pm$ 0.05 nm

5   Technical Data

6   Measurements & Statistical Process Control

6.1 Measurements

See ECTI-STR-001 report by Yimin Zhou et al.

7   Record of Revisions

Rev. 0   First Edition