Thickness and Permeability (against XeF2) of Parylene C film using Parylene Coater

Prepared by Zisong Nie (11/24/2014)

Thickness

- Weight of Parylene in boat: 1000 mg
- Furnace: 690 °C
- Chamber Gauge: 135 °C
- Vaporizer: 175 °C
- Vacuum: 15 milli-atm
- Time after reaching set point: 15 sec

VAS ellipsometer

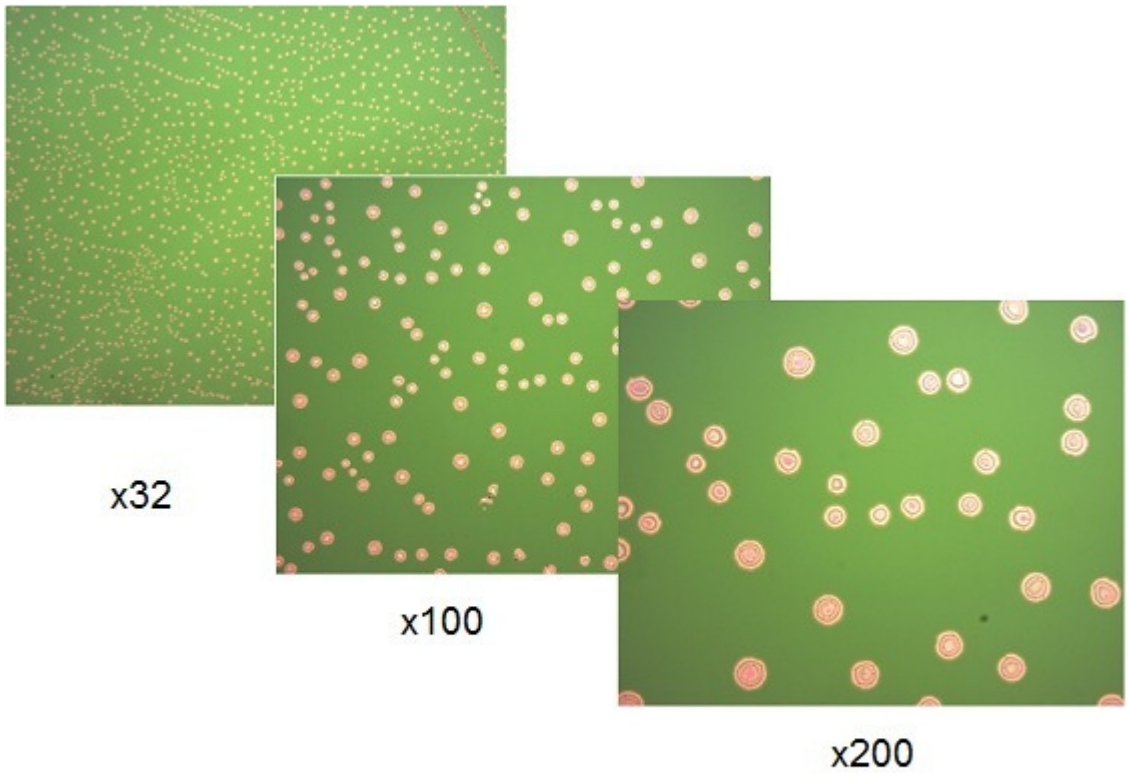
- Cauchy.mat
  - Film thickness = 432.419 ± 4.09 nm
  - MSE(mean square error) = 66.17 (very bad fitting)
- Pt-Pt method
  - 444 - 581 nm

P7 2D stylus profiler

- ~7 nm thick Ti film was deposited on the half of Parylene film, using Explorer14, and was exposed into O2 plasma for 14 min to remove the Parylene film without Ti capping layer, using Technics etcher. The residual Parylene film on Si wafer after the removal was less than 10 nm, measured by Filmetrics F40.
- The thickness was determined by the step height, using P7 2D stylus profiler.
- Thickness determined: 500 nm

Permeability of XeF2

- ~500 nm thick Parylene C on Si wafer was exposed into XeF2.
- XeF2 etcher:
    - The number of cycles: 30
    - Etch time: 60 sec
    - The pressure of XeF2: 3.0 Torr.
    - The pressure of N2: 2.0 Torr



Optical microscope images of Si etching through ~500 nm Parylene film, using XeF2 etcher