Statistical Process Control of 80plus Reactive Ion Etcher

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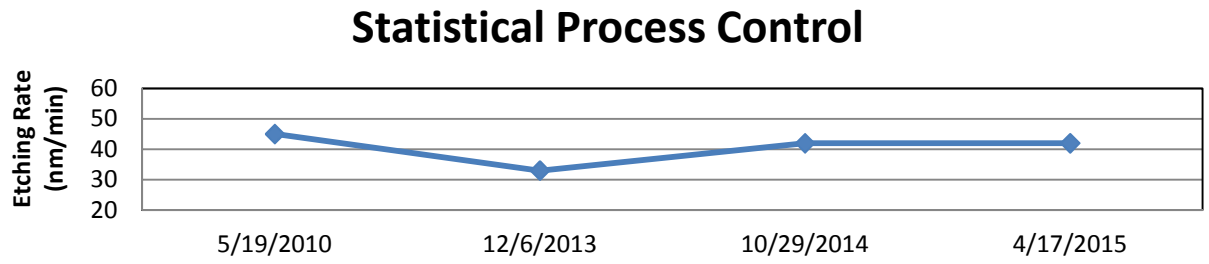
Note: Etch rate also depends on the sample size and percentage of the open area, which is not covered by resist film.

1. SiO2 etch

- Default Recipe

Ar = 38 sccm
CHF3 = 12 sccm
Pressure = 30 mTorr
Power = 200 W
T = 17.5 °C

Date	Etching Rate (nm/min)
5/19/2010	45
12/6/2013	33
10/29/2014	42
4/17/2015	42

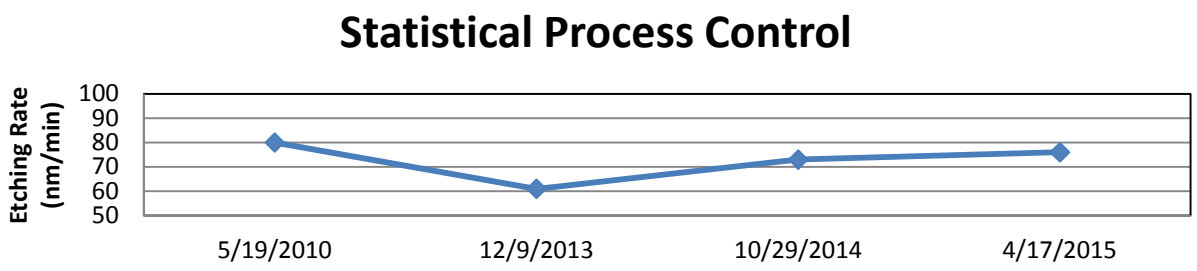


2. SiNx etch

- Default Recipe

O2 = 5 sccm
CHF3 = 50 sccm
Pressure = 20 mTorr
Power = 150 W
T = 17.5 °C

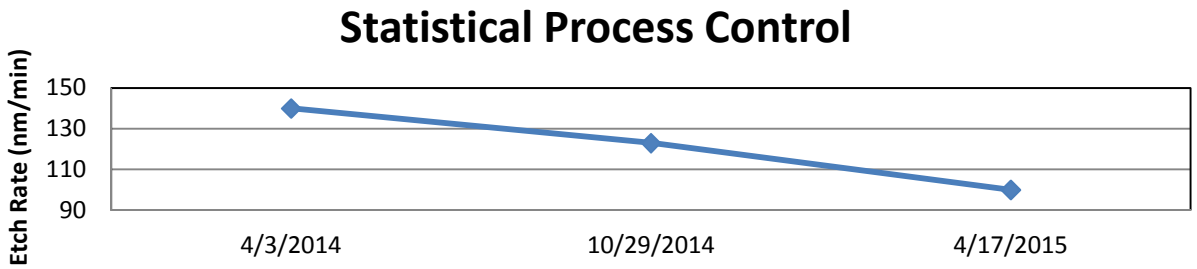
Date	Etching Rate (nm/min)
5/19/2010	80
12/9/2013	61
10/29/2014	73
4/17/2015	76



3. Shallow Si etch

Pressure: 10 mTorr
CHF3: 35 sccm
SF6: 14 sccm
RF power: 100 W
T = 17.5 °C.
Etch rate in the brochure of Oxford = 35 nm/min

Date	Etching Rate (nm/min)
4/3/2014	140
10/29/2014	123
4/17/2015	100



4. Deep Si etch

SF6 = 50 sccm
O2 = 10 sccm
Pressure = 150 mTorr
RF power = 100 W
T = 20 °C
Etch rate 500-700 nm/min (in the brochure)
Selectivity to SiO2 mask: >50:1

Date	Etching Rate (nm/min)
4/3/2014	505
10/29/2014	515
4/17/2015	741