Comparison of Resist Thickness to Sensitivity

March 8, 2010

Objective

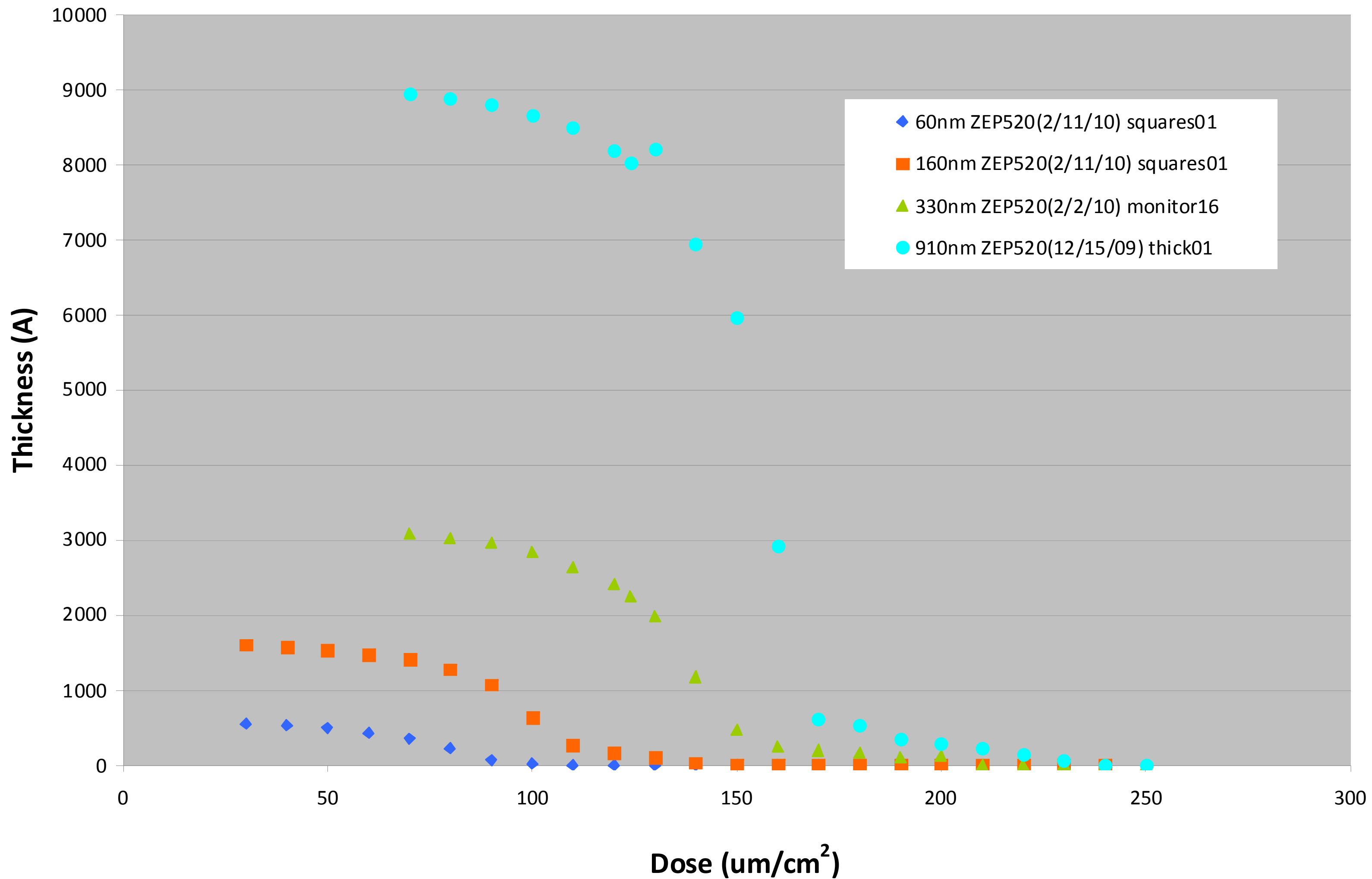
- The following slides demonstrate that the sensitivity of ZEP520a increases as the thickness of the resist decreases.
- This is shown by comparing the contrast curves of various thickness of ZEP520a on silicon wafers.

Procedure

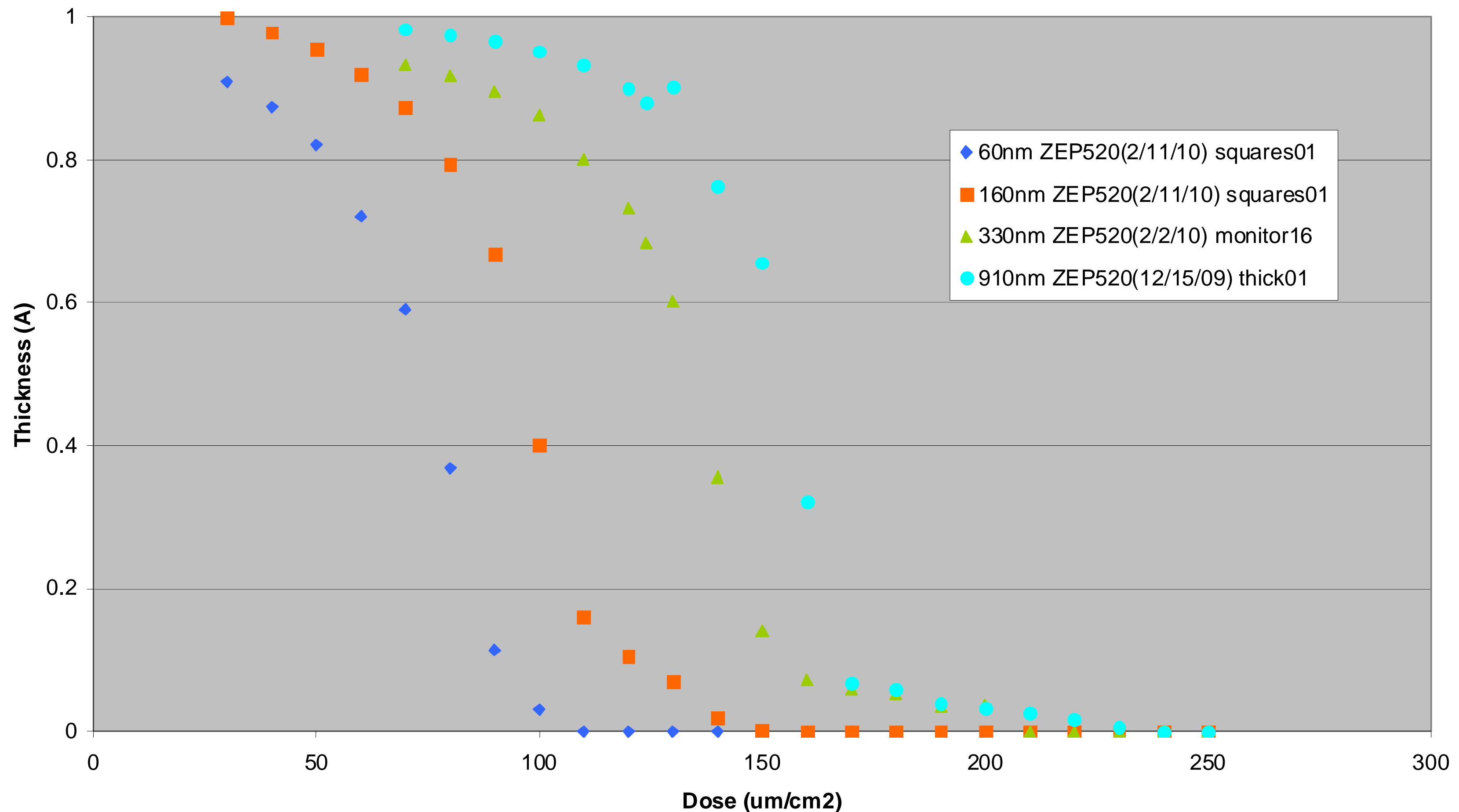
- substrate:
  - 4” silicon wafer, coated first, then snap cleaved into pieces
- coat:
  - ZEP520A resist
  - Various spin speeds and ratios of ZEP520A to Anisole
- expose:
  - 2 nA, 100 kV, shot pitch = 6 nm
  - dose varied, subsequent slides indicate dose
- develop:
  - amyl acetate, 2 min, immersion
  - IPA, 30 sec, immersion
  - N2 blow dry

Various Spin Speeds

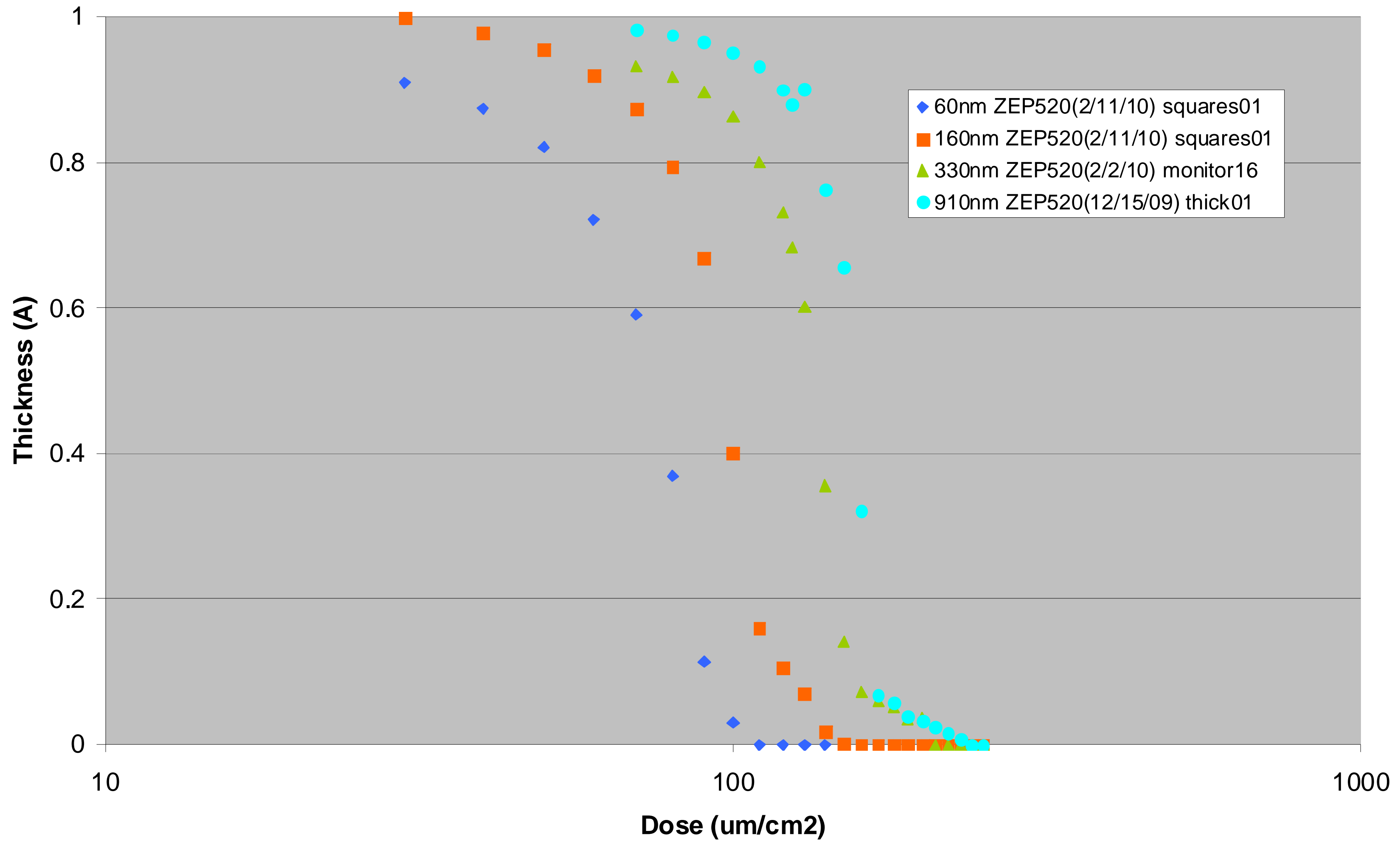
Thickness	Anisole:ZEP520	Spin Speed	Acceleration	Duration
910 nm	Not diluted	500rpm	500 r/s	60 sec
330 nm	Not diluted	4000 rpm	2000 r/s	60 sec
160 nm	1:1 dilution	3000	1500 r/s	60 sec
60 nm	3:1 dilution	2000 rpm	1000 r/s	60 sec



- Thicker resist requires a larger dose to clear all of the resist
  - Therefore, it is less sensitive
- 110, 160, 210, and 240 um/cm² are the first doses to clear 60, 160, 320, and 910 nm ZEP520A, respectively



- The same information as previous slide plotted on a normalized plot.
  - value = remaining thickness/original thickness



- Plotted on a normalized, log plot