AN 435

Accurate Dosimetry for High Dose Plasma Implanted Boron using PCOR-SIMS℠

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Discussion

High dose plasma implantation of boron into silicon results in boron surface concentrations well into the % range and in many cases, well into the 10s of % range. Traditionally, the linearity of SIMS quantification breaks down once percent levels of a dopant or impurity are reached and quantification accuracy is reduced. Quantification is further complicated by the presence of surface oxide and again by changing sputter rates as a function of boron and oxygen concentration.

At EAG, we have taken all of these effects into consideration and have developed a new analysis protocol (**PCOR-SIMS*** for ULE B). The result is an accurate boron concentration vs. depth curve in the critical high concentration region that provides best-ever SIMS dosimetry for high dose, high concentration implants.

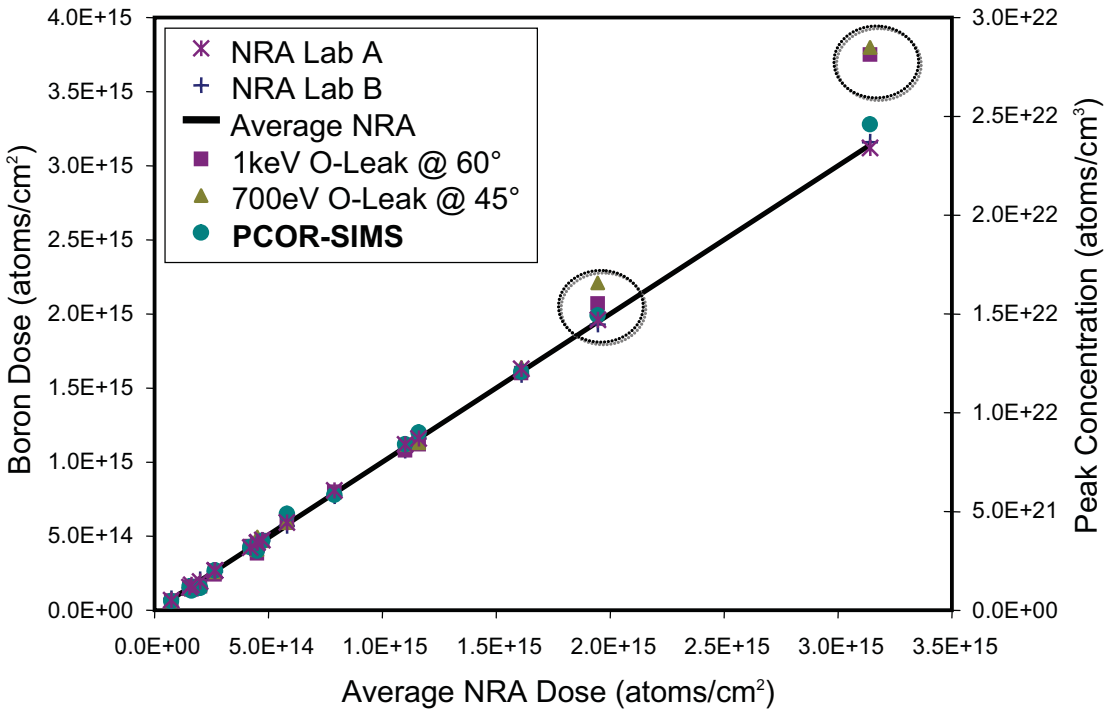

Figure 1. SIMS dosimetry is compared with NRA from 2 independent laboratories. SIMS and NRA dosimetry using all analysis protocols are good up to about 1.5E+15 at/cm² dose. Above this concentration, only **PCOR-SIMS** for ULE B accurately takes sensitivity factor and sputter rate effects into account and reports accurate dosimetry.

* The new PCOR-SIMS℠ for ULE B protocol is the result of extensive development efforts by EAG. The "PCOR-SIMS℠" name describes, in part, EAG's proprietary methodology that includes point-to-point correction resulting in the most accurate SIMS profiling yet for ultra shallow implants.

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